

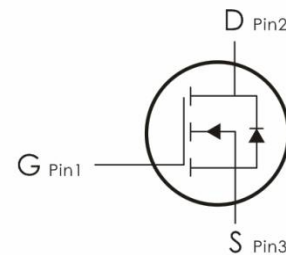
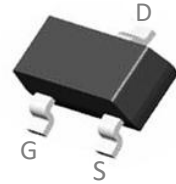
Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=30V, I_D=5.5A, R_{DS(ON)} < 30m\ \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current- $T_A=25^\circ C^1$	5.5	A
	Continuous Drain Current- $T_A=70^\circ C^1$	3.8	
I_{DM}	Pulse Drain Current Tested ²	17	A
P_D	Power Dissipation- $T_A=25^\circ C^3$	1.15	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ¹	108.69	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	80	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DO3400DA	A09T	SOT-23-3

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =24V, T _j =25 °C	---	---	1	μ A
		V _{GS} =0V, V _{DS} =24V, T _j =55 °C	---	---	5	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 12V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	0.5	0.7	1.2	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =4A	---	25	30	m Ω
		V _{GS} =4.5V, I _D =3A	---	28	40	
		V _{GS} =2.5V, I _D =2A	---	35	47	
G _{FS}	Forward Transconductance	V _{DS} =5V, I _D =3A	---	19	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	660	920	pF
C _{oss}	Output Capacitance		---	50	70	
C _{rss}	Reverse Transfer Capacitance		---	42	60	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =15V, I _D =3A, V _{GS} =4.5V, R _G =3.3 Ω	---	3.2	6.4	ns
t _r	Rise Time		---	41.8	75	ns
t _{d(off)}	Turn-Off Delay Time		---	21.2	42	ns
t _f	Fall Time		---	6.4	12.8	ns
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =15V, I _D =3A	---	8.34	11.7	nC
Q _{gs}	Gate-Source Charge		---	1.26	1.8	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	1.88	2.6	nC

R_G	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	1.5	3	Ω
Drain-Source Diode Characteristics						
V_{SD}	Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V
I_S	Source drain current ^{1,4}	$V_G=V_D=0V, \text{ Force Current}$	---	---	5.5	A
I_{SM}	Pulsed Source Current ^{2,4}		---	---	17	A
T_{rr}	Reverse Recovery Time	$I_F=3A, dI/dt=100A/\mu s, T_J=25^\circ C$	---	6.8	---	ns
Q_{rr}	Reverse Recovery Charge		---	2.3	---	nC

Notes:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

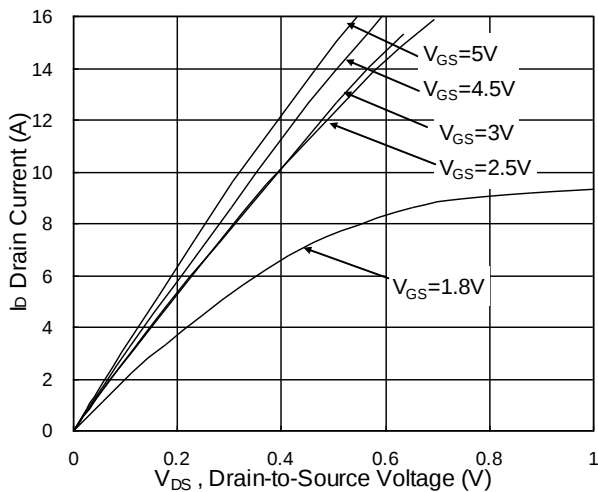


Fig.1 Typical Output Characteristics

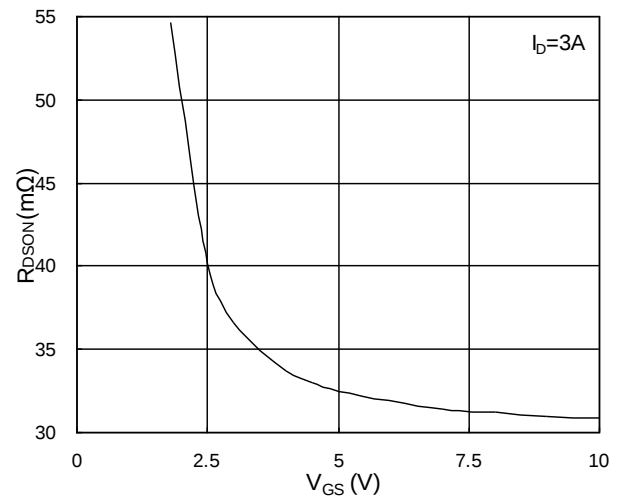


Fig.2 On-Resistance vs G-S Voltage

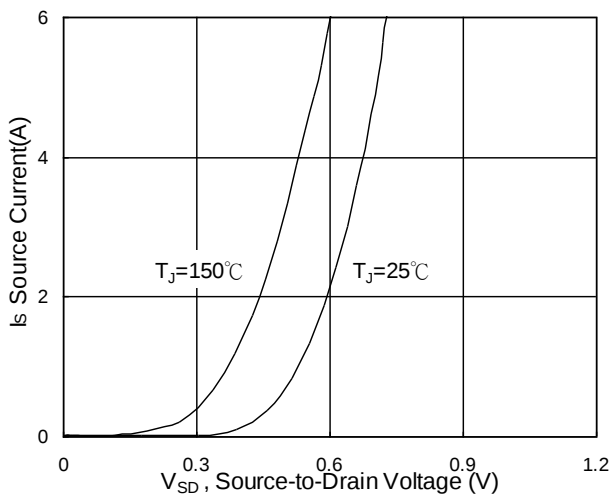


Fig.3 Source Drain Forward Characteristics

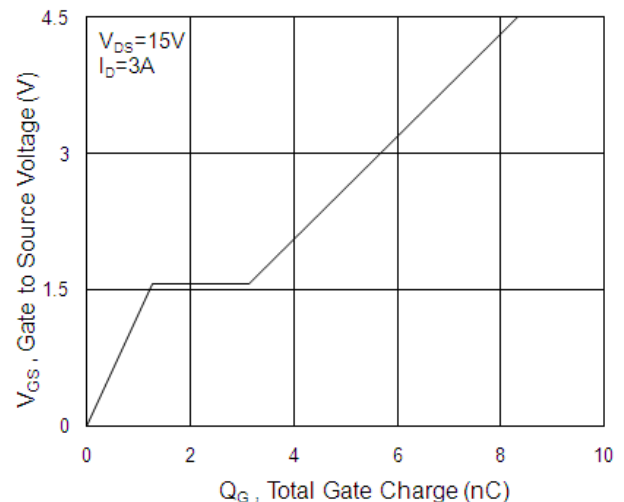


Fig.4 Gate-Charge Characteristics

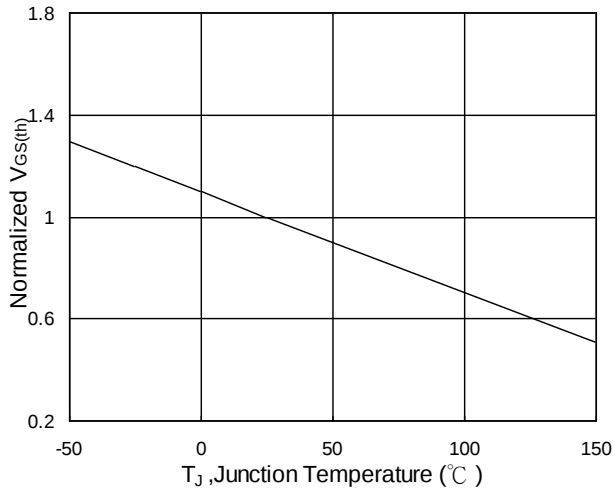


Fig.5 Normalized $V_{GS(th)}$ vs T_J

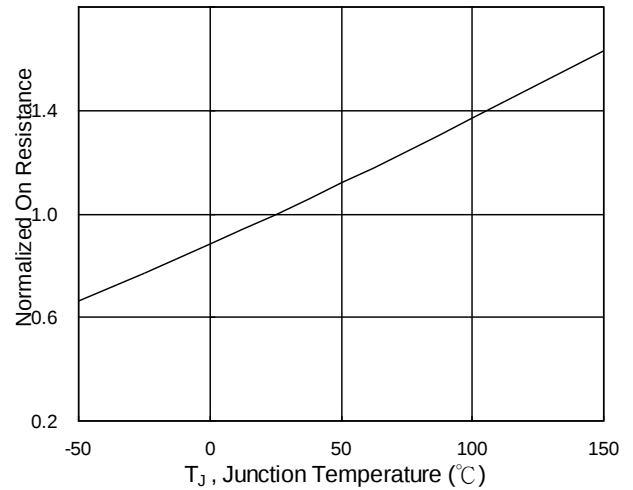


Fig.6 Normalized $R_{DS(on)}$ vs T_J

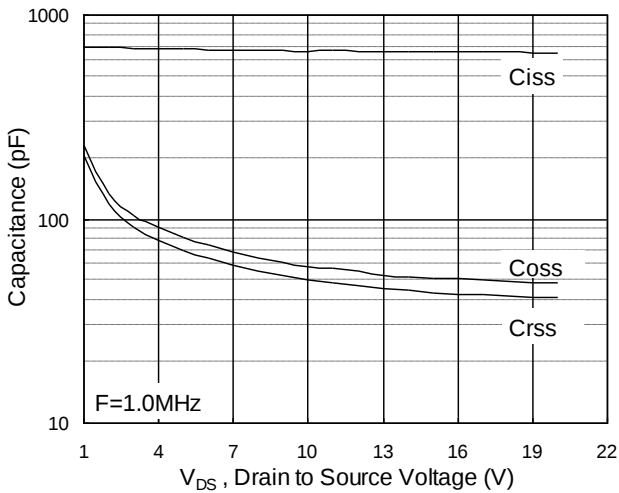


Fig.7 Capacitance

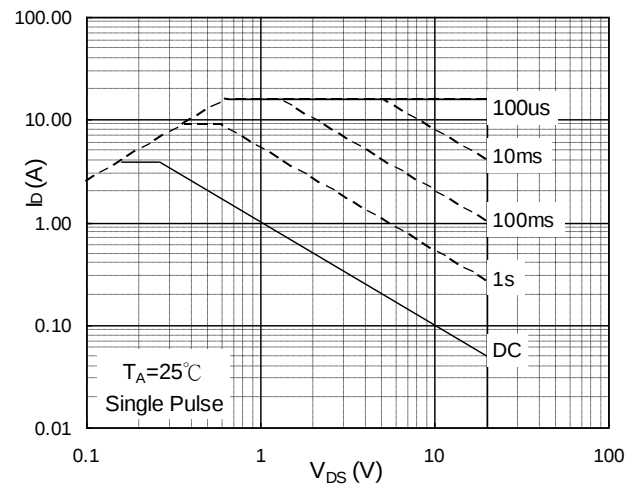


Fig.8 Safe Operating Area

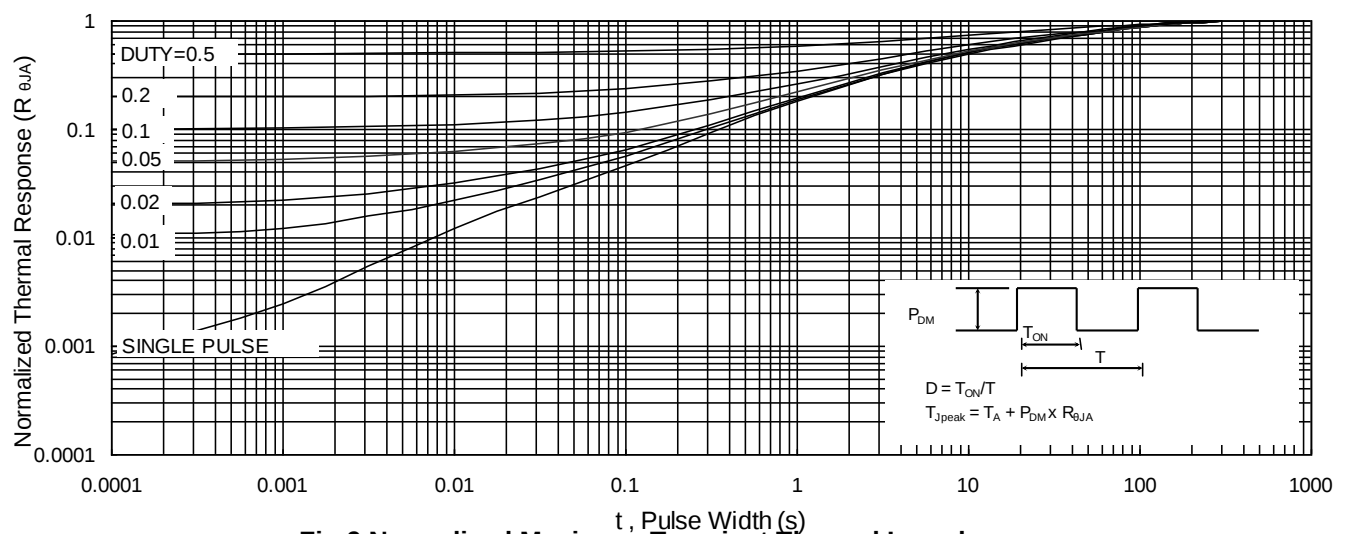


Fig.9 Normalized Maximum Transient Thermal Impedance

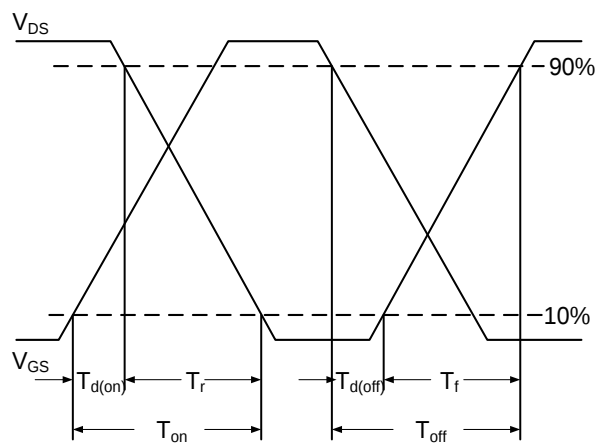


Fig.10 Switching Time Waveform

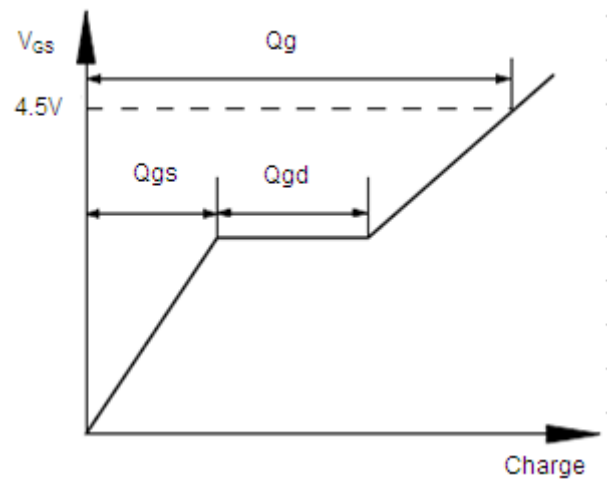


Fig.11 Gate Charge Waveform